CLAIMS:

The invention claimed is:

1. A substrate susceptor for receiving a semiconductor substrate for selective epitaxial silicon-comprising depositing thereon, the depositing comprising measuring emissivity of the susceptor from at least one susceptor location in a non-contacting manner, the susceptor comprising:

a body having a front substrate receiving side, a back side, and a peripheral edge; and

at least one susceptor location from which emissivity is to be measured being received on at least one of the front substrate receiving side, the back side, and the edge; said at least one susceptor location comprising an outermost surface comprising a material upon which selective epitaxial silicon will not deposit upon during selective epitaxial silicon depositing on a semiconductor substrate received by the susceptor for at least an initial thickness of epitaxial silicon depositing on said substrate.

2. A substrate susceptor for receiving a semiconductor substrate for selective epitaxial silicon-comprising depositing thereon, the depositing comprising measuring emissivity of the susceptor from at least one susceptor location in a non-contacting manner, the susceptor comprising:

a body having a front substrate receiving side, a back side, and a peripheral edge, the body comprising SiC coated graphite; and

at least one susceptor location from which emissivity is to be measured being received on at least the back side, said at least one susceptor location comprising an outermost surface layer received over the SiC and comprising a material upon which selective epitaxial silicon will not deposit upon during selective epitaxial silicon depositing on a semiconductor substrate received by the susceptor for at least an initial thickness of epitaxial silicon depositing on said substrate.

3. A substrate susceptor for receiving a semiconductor substrate to be deposited upon by thermal deposition comprising susceptor back side radiant heating, the susceptor comprising a body having a front substrate receiving side, a back side, and a peripheral edge; the body comprising multiple materials having at least two different thermal conductivities; an outer material received across the back side having a higher thermal conductivity than an immediately adjacent material of the body, the outer material comprising at least one of polycrystalline diamond and copper.

4. A substrate susceptor for receiving a semiconductor substrate to be deposited upon by thermal deposition comprising susceptor back side radiant heating, the susceptor comprising a body having a front substrate receiving side, a back side, and a peripheral edge; the body comprising multiple materials having at least two different thermal conductivities; an outer material received across the back side having a higher thermal conductivity than an immediately adjacent material of the body, the outer material not being received over an outer portion of any of the front substrate receiving side.

5. A substrate susceptor for receiving a semiconductor substrate to be deposited upon by thermal deposition comprising susceptor back side radiant heating, the susceptor comprising a body having a front substrate receiving side, a back side, and a peripheral edge; the body comprising multiple materials having at least two different thermal conductivities; an outer material received across the back side having a thermal conductivity which is at least three times higher than that of an immediately adjacent material of the body.

6. A substrate susceptor for receiving a semiconductor substrate to be deposited upon by thermal deposition comprising susceptor back side radiant heating, the susceptor comprising a body having a front substrate receiving side, a back side, and a peripheral edge; the body comprising SiC coated graphite, an outer material received across the back side over the SiC, the outer material having a higher thermal conductivity than that of the SiC and the graphite.

7. A substrate susceptor for receiving a semiconductor substrate to be deposited upon by thermal deposition comprising heating of the susceptor, the susceptor comprising a body having a front substrate receiving side, a back side, and a peripheral edge; the body comprising multiple materials which have at least two different thermal conductivities and are received at different radial locations and not across an entirety of either the body front side or body back side.

8. A substrate susceptor for receiving a semiconductor substrate to be deposited upon by thermal deposition comprising heating of the susceptor, the susceptor comprising a body having a front substrate receiving side, a back side, and a peripheral edge; the body comprising a peripheral-most region comprising at least 10% of radius of the body and an inner region received radially inward of the peripheral-most region, the body comprising multiple materials having at least two different thermal conductivities; the peripheral-most region and the inner region having different average thermal conductivities.

9. A substrate susceptor for receiving a semiconductor substrate to be deposited upon by thermal deposition comprising heating of the susceptor, the susceptor comprising a body having a front substrate receiving side, a back side, and a peripheral edge; the body comprising a peripheral-most region, a first region received radially inward of the peripheral-most region, and a second region received radially inward of the first region; the body comprising multiple materials having at least two different thermal conductivities; the first region having an average thermal conductivity which is different from average thermal conductivity of the second region.

10. A substrate susceptor for receiving a semiconductor substrate to be deposited upon, the susceptor comprising a body having a front substrate receiving side, a back side, and a peripheral edge; the body comprising at least one solid portion therethrough that is transparent to infrared radiation.

11. A method of depositing a material over a semiconductor substrate comprising:

positioning a semiconductor substrate on a susceptor, the susceptor having at least one solid portion therethrough that is transparent to infrared radiation and over which the semiconductor substrate is received;

depositing a material over the semiconductor substrate; and

during the depositing, detecting substrate temperature by measuring substrate emissivity from a back side of the semiconductor substrate through the at least one infrared radiation transparent portion of the susceptor from a back side of the susceptor using a non-contacting emissivity sensor.

12. A method of depositing a material over a semiconductor substrate comprising:

positioning a semiconductor substrate on a susceptor, the susceptor having a front substrate receiving side and a back side, the susceptor having at least one solid portion therethrough that is transparent to infrared radiation and over which the semiconductor substrate is received;

depositing a material over the semiconductor substrate; and

during the depositing, impinging radiant energy onto the susceptor back side through the transparent solid portion effective to heat the semiconductor substrate being deposited upon.

13. A substrate susceptor for receiving a semiconductor substrate to be deposited upon, the susceptor comprising a body having a front substrate receiving side face, a back side face, and a peripheral edge; the body comprising a ring having a radial inner portion at least a radial majority of which is non-solid space extending from the front side face to the back side face.

14. A method of depositing an elemental silicon-comprising material over a semiconductor substrate, comprising:

positioning a semiconductor substrate on a susceptor, the susceptor having a front substrate receiving side face and a back side face, the susceptor comprising a ring having a radial inner portion at least a radial majority of which is non-solid space extending from the front side face to the back side face, the semiconductor substrate comprising a front side and a back side;

depositing an elemental silicon-comprising material at least on the substrate front side; and

during the depositing, impinging radiant energy onto the substrate back side through the radial central non-solid portion of the susceptor.

15. A method of selectively depositing an epitaxial silicon-comprising material over a semiconductor substrate, comprising:

positioning a semiconductor substrate on a susceptor, the susceptor having a front substrate receiving side face and a back side face, the susceptor comprising a ring having a radial inner portion at least a radial majority of which is non-solid space extending from the front side face to the back side face, the semiconductor substrate comprising a front side and a back side, the substrate back side comprising an exposed material other than monocrystalline silicon; and

selectively depositing an epitaxial silicon-comprising material on at least a portion of the front side of the semiconductor substrate as compared to the back side of the semiconductor substrate which is exposed through the radial central non-solid portion of the susceptor during the depositing.

16. A substrate susceptor for receiving a semiconductor substrate to be deposited upon, comprising:

a body having a front substrate receiving side, a back side, and a peripheral edge; and

at least three movable substrate edge clamps associated with the body, the movable substrate edge clamps being positioned to engage a peripheral edge of a semiconductor substrate received by the body for deposition thereupon.

17. A method of depositing material over a semiconductor substrate comprising:

positioning a semiconductor substrate on a susceptor;

engaging a peripheral edge of the semiconductor substrate with at least three radially movable substrate edge clamps on the susceptor;

causing the susceptor with semiconductor substrate to rotate; and

depositing a material over the semiconductor substrate while the semiconductor substrate is engaged with the substrate edge clamps.

18. A method of depositing material over a semiconductor substrate comprising:

positioning a semiconductor substrate on a susceptor;

rotating the susceptor with semiconductor substrate at a rotational speed effective to cause at least three radially movable substrate edge clamps on the susceptor to engage a peripheral edge of the semiconductor substrate; and

after and while engaging the peripheral edge of the semiconductor substrate with the at least three radially movable substrate edge clamps, continuing rotation of the susceptor while depositing a material over the semiconductor substrate.

19. A substrate susceptor for receiving a semiconductor substrate to be deposited upon, comprising:

a body having a front substrate receiving side, a back side, and a peripheral edge; and

a substrate bearing surface on the front substrate receiving side, the bearing surface comprising at least one vacuum opening configured to apply a pulling force on a semiconductor substrate received by the body against the bearing surface.

20. A method of depositing material over a semiconductor substrate comprising:

positioning a semiconductor substrate on a substrate bearing surface of a susceptor, the bearing surface comprising at least one vacuum opening therein;

applying a vacuum force to the at least one opening effective to apply a pulling force on the semiconductor substrate against the bearing surface; and

while the vacuum force is applied, rotating the susceptor while depositing a material over the semiconductor substrate.

21. A substrate susceptor for receiving a semiconductor substrate to be deposited upon, comprising:

a body having a front substrate receiving side, a back side, and a peripheral edge; and

a surface on the front substrate receiving side over which at least a portion of a semiconductor substrate to be deposited upon is to be received, the surface comprising at least three gas emitting openings configured to apply a substrate levitating and rotating force from gas emitted from the openings effective to levitate and rotate said semiconductor substrate relative to the susceptor body.

22. A method of depositing material over a semiconductor substrate comprising:

positioning a semiconductor substrate over a surface of a susceptor, the surface comprising at least three gas emitting openings therein;

emitting gas from the at least three openings effective to levitate and rotate the semiconductor substrate relative to the susceptor; and

while levitating and rotating the semiconductor substrate relative to the susceptor, depositing a material over the semiconductor substrate.